

## Tutorial “Creating Vector Graphics“

This tutorial will guide you through the creation of your own vector graphic and show you how best to meet the specific criteria for our print process.

We recommend designing your graphic in the following two programs two programmes: Corel Draw or Adobe Illustrator. There are differences with both programs, but the basics are always the same.


We'll take you through the process using Corel Draw 11 and Adobe Illustrator CS2.

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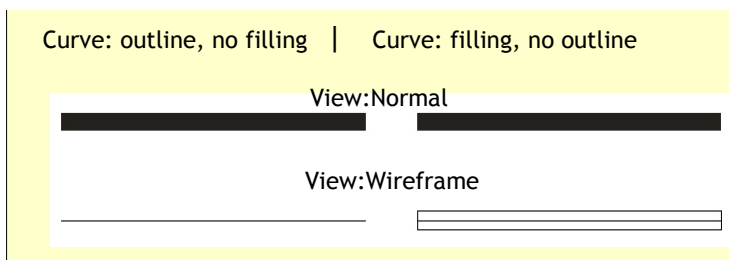
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## Section 1: Simple Lines

### A 1.1: Corel Draw 11

1. Open a new document: 'File - New'
2. Create a line:
  - a) select the 'Freehand Tool' 
  - b) Click and release to make a point in the workspace, drag the mouse to create a line in any direction and set the end point by, once again, clicking and releasing.
3. The length of the line is set by the end points. You can change the width under object properties (Window - Dockers - Properties)
4. The line is represented by an 'outlined curve' - however, for printing, it is important to convert this line into a 'filled curve' without an outline. To do this: click on 'Arrange' - '**Convert Outline to Object**' or just use ctrl+shift+Q .

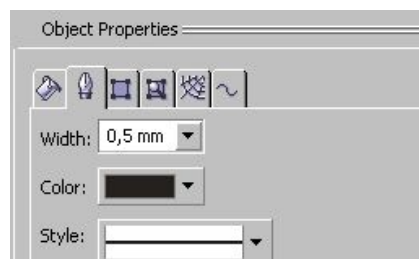
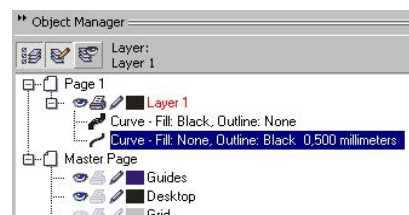
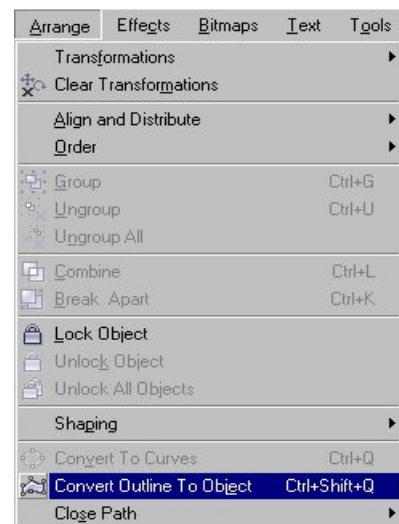
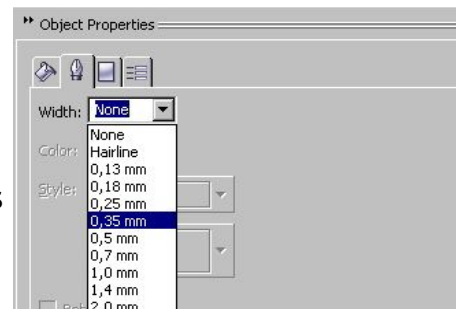
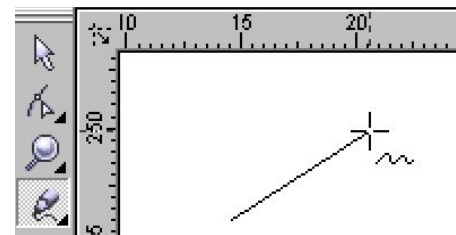
You will see the difference in another view (View - Outline) or in the object manager (Window - Dockers - Object Manager)



To ensure that your design stays intact during production, all elements must be at least 1.5 mm thick.

For a design that's about 30x30 cm, the width of the outline would be about 5.0 points.

The maximum design size at Spreadshirt is 30x30 cm - in order to make sure that the design fits on all t-shirts, we recommend a maximum design size of 22.5x22.5 cm.



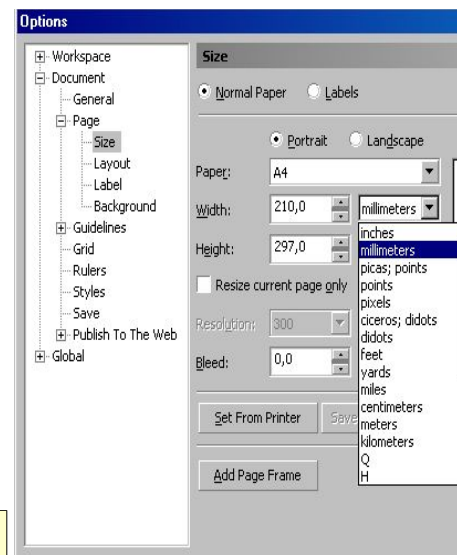
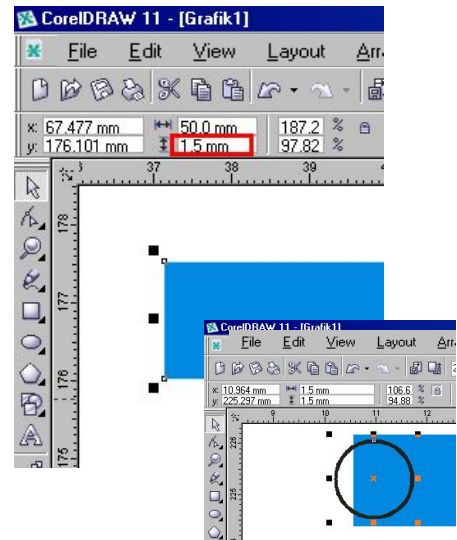
5. There are two ways to check if your line is thick enough, so that your design will be ready for printing:

a) Select the line and check if it is bigger than 1.5 mm thick using the Object Size Tool (only possible for straight lines!)

b) Use the Ellipse Tool to make a circle that's 1.5 mm across and check that the line is thicker than the circle.

*You can set the particulars (mm, pt, etc.) under 'Layout' - 'Page Setup' in case the settings are different.*

6. If the line is too thin, you can create an outline around the selected line: under object properties you can add an outline then 'convert outline to object' using **ctrl+shift+Q**. By the way - this step works better in Adobe Illustrator when working with More complex designs.

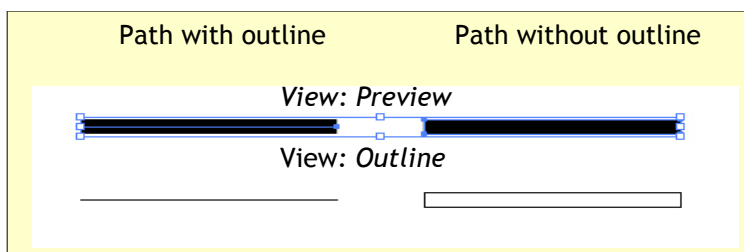
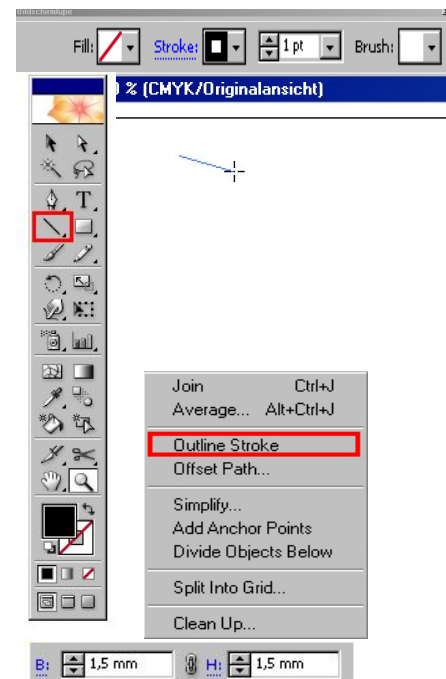


The size of the design changes the width of the outline. With a large design, for example, an outline of about 20 pt. is hardly visible. For a small design, an outline of 1 pt. can be too thick. In general, the design sized A4 can have an outline of 5 points and it works with Spreadshirt's requirements (the outline is thicker than 1.5 mm).

*Note: Curves in Corel Draw are Paths in Adobe Illustrator. Outlines are called Strokes in Adobe.*

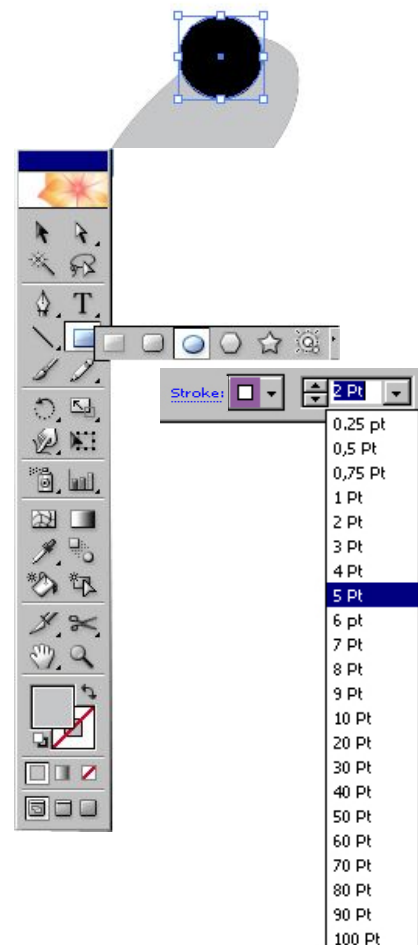
## A 1.2: Adobe Illustrator CS2

1. Open a new document: 'File' - 'New'
2. You can create a line with a Line Segment Tool - use it like in Corel Draw.
3. Set a startpoint by clicking the mouse and dragging in any direction. The end point will be made when you release the mouse. The stroke weight (width of the line) can be edited under Stroke in the menu or under Window - Stroke (you can also align the stroke: centre, outer, inner).
4. Converting to outlines works much more easily than in Corel Draw. Especially for more complex designs! In order to convert lines, first mark the line (or select all: ctrl+A) and go to Object - Path - Outline Stroke
5. The difference will also be clearer in another view (View - Outline)



6. In order to check if a line is thick enough, you can draw a circle that's 1.5 mm thick. If the circle is always smaller than the line, the design is fine. If the line's too thin, then add another outline to the line, or make the entire design larger.

*You can edit the particulars under  
File - Document Setup*



## Section 2: Empty Spaces

### A 2.1: Corel Draw 11

1. Holes, or empty spaces are essential for vector graphics. These are spaces where another colour or the colour of the t-shirt should show through.
2. The width (or height) of these spaces cannot be less than 1 mm. You can check for this by creating a circle that's 1mm across. The circle should not be larger than the space at any point.

#### 3. How do I create these empty spaces?

First, create a negative by creating an object you will use to cut out a shape in the design. This can either be a rectangle, circle or another shape using the Freehand Tool.

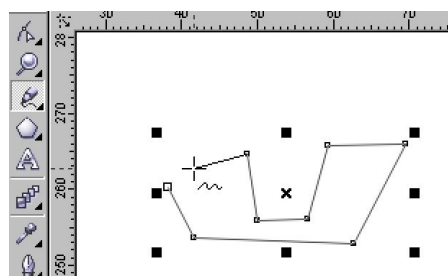
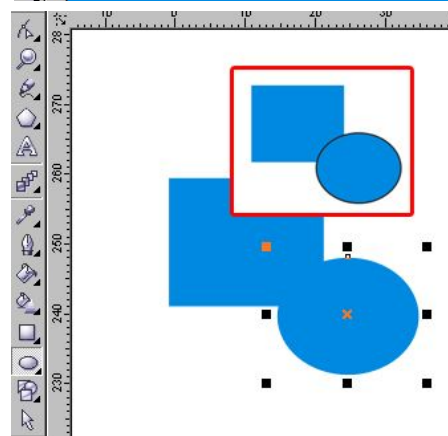
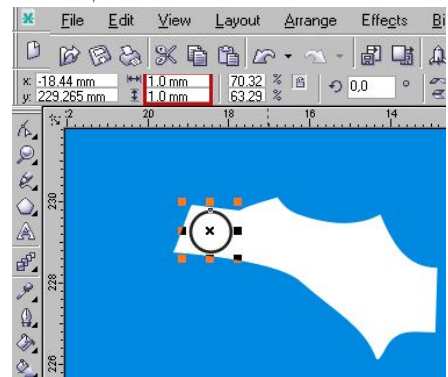
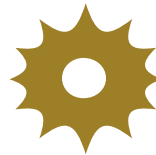
##### a) Rectangles and circles

Use the Rectangle Tool (or the Circle Tool) to create the shape you want. Just select the tool, and left-click on the place on the workspace where you want the object to start. Still holding down, move the shape into the size that you want, and let the mouse go!

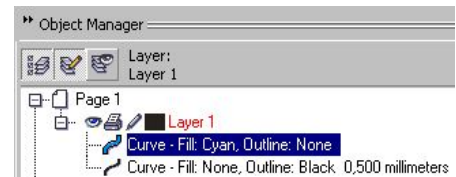
Pay attention that in the object properties that you select 'none' for the outline width to make sure that the object you create is only made out of one colour (filling)!

##### b) Freehand tool

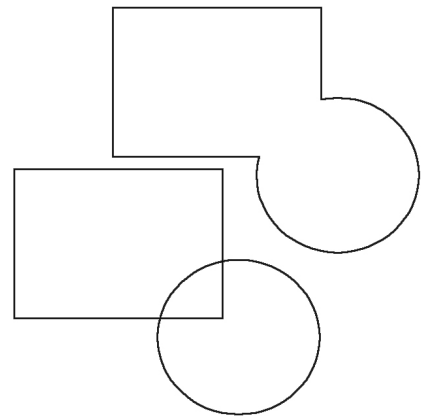
You can use the freehand tool to quickly combine many lines into complex forms. Select the freehand tool, click to set a start point, without releasing drag to create a line and set an end point by double-clicking (this makes sure that the last point isn't set as a new start point). Drag again to continue the shape with a new line, set the end point and so on...Make sure to check that the form is closed (that the end point of the last line connects to the start point of the first line).



At the end you can fill in the final form with a colour and remove the outline. Check in the object manager if the curve really has a filling and doesn't have an outline.



4. Multiple objects should be welded, so that in the end you'll just have a single object. You can select this option automatically if you select multiple curves. The difference is really clear in View - Outline option. All overlapping objects will be 'welded' into one object.

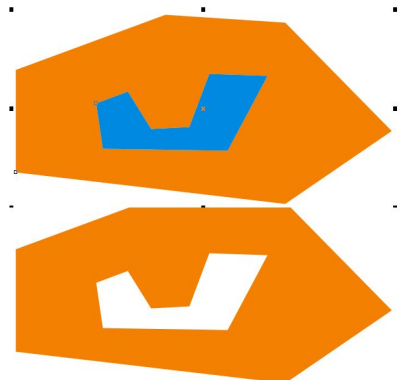


5. The finished "negative" is ready to be applied to the design. Select the negative, position it where you want (pay attention that the negative lies over the actual design) and use the Simplify function.



Afterwards, you can delete the negative, and see that the form will be completely cut out of the design below.

*Remember to check the size (see Section 2.)*





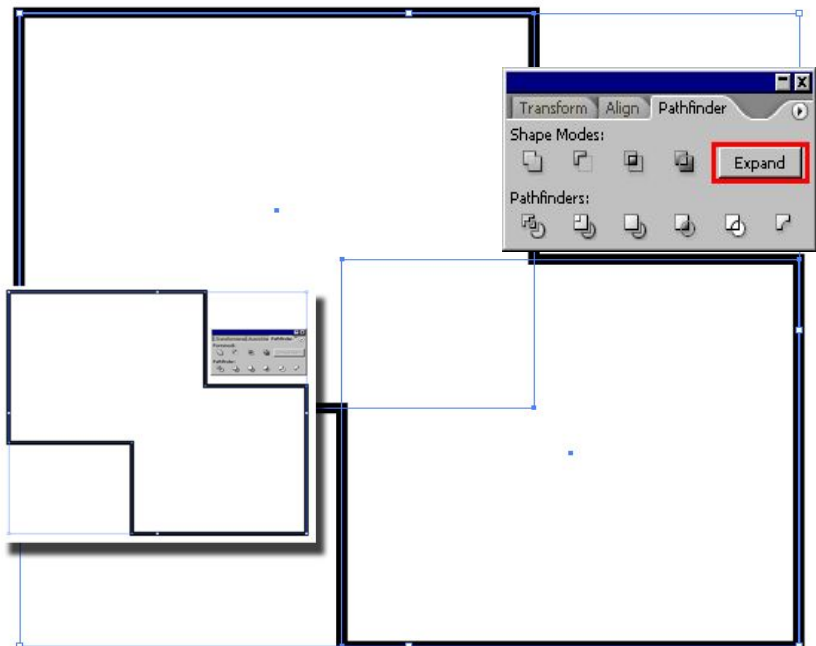
## A 2.2: Adobe Illustrator CS2

1. Creating "negatives" to cut out empty spaces in an object functions similarly in Adobe Illustrator as in Corel Draw.



2. There are rectangles, ellipses, stars and many other forms in the toolbar. With Adobe Illustrator CS2 and later versions, there's an easy tool - the paintbrush - for making closed vector graphics (see example in Section 5).  
All layers that are made up of closed lines are automatically integrated into a path (a layer).

3. The function 'Add to Shape Area' is similar to the weld function in Corel and is available under Pathfinder (Menu: Window-Pathfinder). This lets you integrate selected objects into a single integrated layer (click on expand to let it do its magic!). Check to make sure that the stroke weight is 0 pt.





4. To cut a shape out of your design using this negative, simply click on "Merge" (like Corel's Simplify).

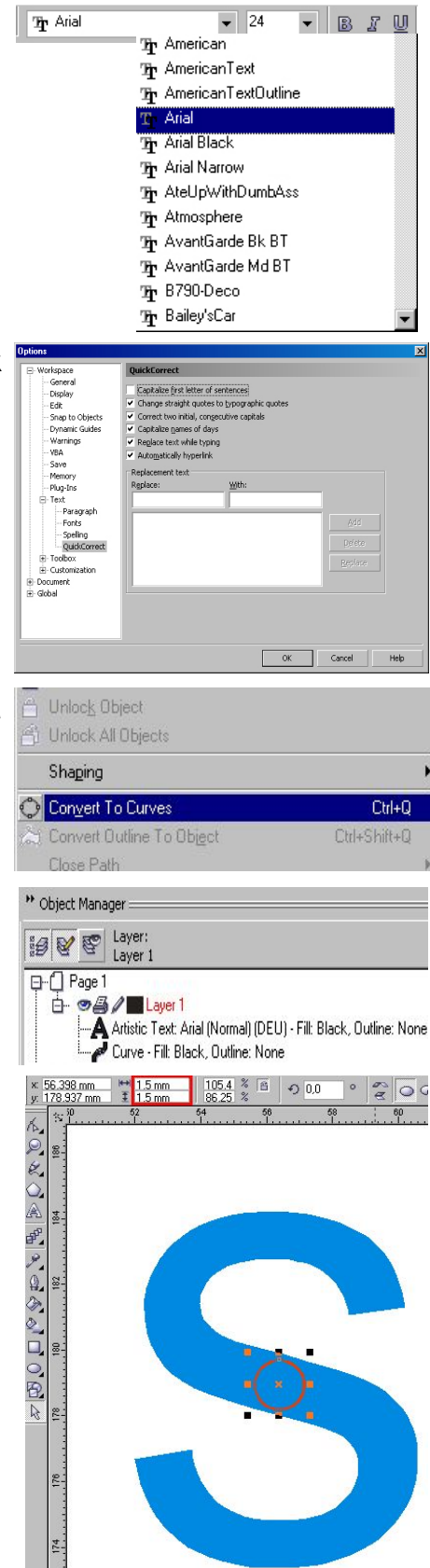


## Section 3: Letters

### Section 3.1: Corel Draw 11

1. You can create text in Corel Draw with the Text Tool (F8). 
2. Once you've selected this you'll see a menu with various fonts and sizes. Find the font you like and click OK. Click to set a start point for your text and a cursor will start to blink. Begin typing your text.
3. To get out of the typing mode, you'll have to click again on the 'Selection' Tool. 
4. The first letter is usually automatically written in capitals - you can change this function under the menu point 'Text' - 'Writing Tools' - 'Quick Correct'.
5. Once the text has been positioned and set in the right size, you must convert it to curves for it to be printable. To do so, select the text and under Arrange click on 'Convert to Curves') or just 'ctrl+Q'.
6. The object manager shows you this more clearly - from the graphic text, you'll get a plot-printable curve with filling and no outlines.
7. The rules for object sizes also applies for text: they must be at least 1.5 mm wide. The easiest way to check if the text is big enough is to create a circle with a 1.5mm diameter (see Section A1.1). Make sure that the circle isn't larger than the smallest part of the text.

For empty spaces in texts (e.g. with B or O), the empty space rule (at least 1mm wide/high) also applies. When in doubt, draw another circle!





8. If the lines in the text are too thin, you have two options:

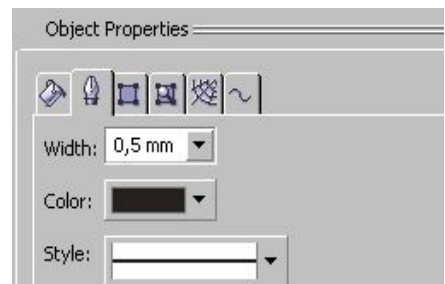
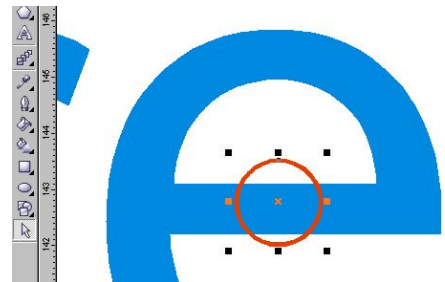
**a) increase the text size**

until the lines are thick enough. To do so - select the text and left-click on the black corners and drag the mouse to increase the size. Afterwards, check again with the circle to make sure it's now large enough.

**b) Add an outline**

That's easy - select the text and in the object properties select the thickness you want for the outline. Afterwards, you'll have to convert the outline into curves. This function available under Arrange - Convert to Curves.



In Corel Draw 12 (or lower), you might run into problems when converting an outline to an object. At best, make your outline in Adobe Illustrator. Just copy the design from Corel (ctrl+C) and paste it into Adobe (ctrl+V) [see A3.2, point 6].



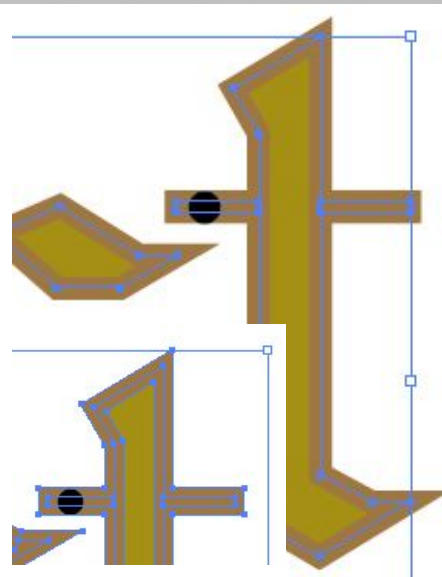
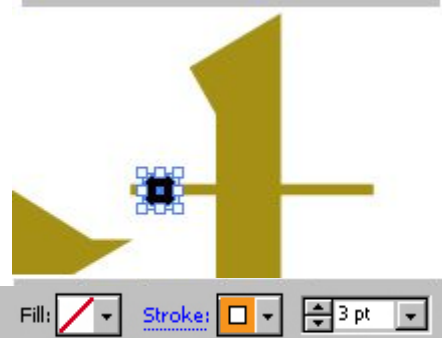
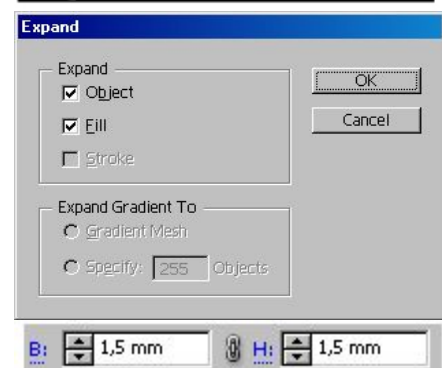
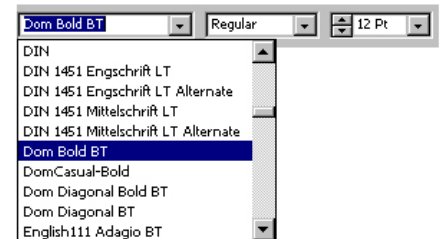
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## Section 3.2: Adobe Illustrator CS2

1. You can create text in Adobe Illustrator with the Type Tool.  If don't have a document, open a new one, select the text tool, click where you want to write and enter in your text.
2. Once you've done so, the text functions are active. To get out - go to the menu and click on the Selection Tool. 
3. Get back in by double-clicking on the text area. By pressing 'ctrl+A', you can set the settings (e.g. font or size) for the entire text.
4. To make the text into printable curves (paths), select the text, and go to the menu point 'Object' - 'Expand' and click 'OK' to confirm to convert the object to layer.
5. To check the size, do the same as with Corel Draw (make a circle 1.5mm across and compare).
6. If the lines of the text are too thin (following the step above: when the 1.5 mm circle is bigger than the thinnest line in the text), you can either make the text size bigger or add a contour.

To add a contour, select the text and add a contour until the width is larger than the 1.5mm test-circle (for example: a contour that's 3 points thick is enough for the text to be thick enough). Afterwards, you'll have to convert the contours to paths (so that it's printable). Do this under 'Object' - 'Path' - 'Outline Stroke' (you can see the difference in the blue outlines in Adobe).



## Section 4: Points and Lines

### Section 4.1: Corel Draw 11

1. The problem of the points of lines has been widely discussed. What, for example, should happen with suns and stars, or even more simply: triangles.

The thickness of the point is dependent on the angle - but it's not so easy to measure. One way is to create a 1.5mm circle, and run along the line of the design until the left and right lines of the design line up with the circle. If the space from this point until the point of the design is longer than 10mm, the design is too thin. If the length is shorter than 10mm, the width is OK.

2. You can measure the length to the point easily - draw a rectangle that's 10mm long. Check if that's the length from the circle/lines meeting to the point of the shape

3. What should you do if the line is too thin?

There are three options:

a) add an outline

b) shorten the end of the line:

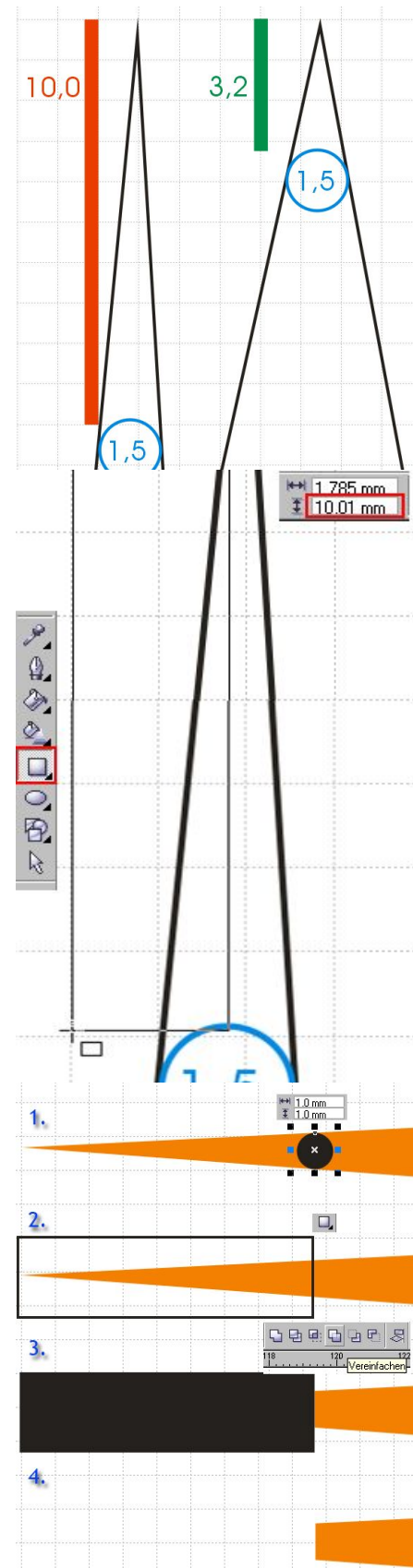
Don't let the line run until the end. Rather, before make a rectangle out of the triangle - so that it ends in a 1 mm thick end.

1. Check by creating a 1 mm circle and see where the line is 1 mm thick.

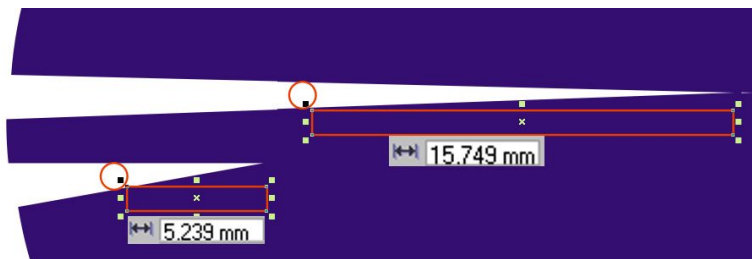
2. Then draw a rectangle that completely covers the end.


3. Mark the line and the rectangle and use the Simplify function.

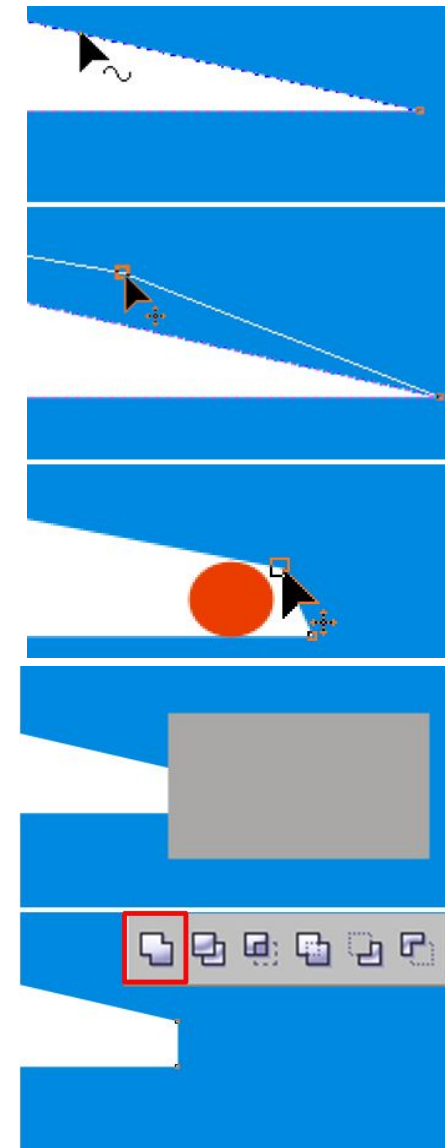
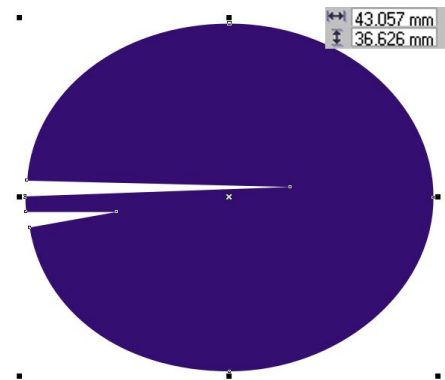
4. Then delete the rectangle and you'll get a line where the end point has been cut off.





4. *On the other side:*  
*make sure that the cutouts of the design (like in the letters B and O), are at least 1 mm wide.*
5. When making these cutouts, pay attention to the width.
6. To test the width, you can use the same trick we talked about in Point 1. Just with the difference that the cutout just needs to be at least 1mm wide (not like lines outside a design which have to be at least 1.5 mm wide!).
7. An Example - If the cutout is too thin: the length of the point that's 1 mm wide until the point is 15.77 (>10mm). The cutout below is fine - the length from the 1mm wide point until the endpoint is 5.2 mm (<10mm).

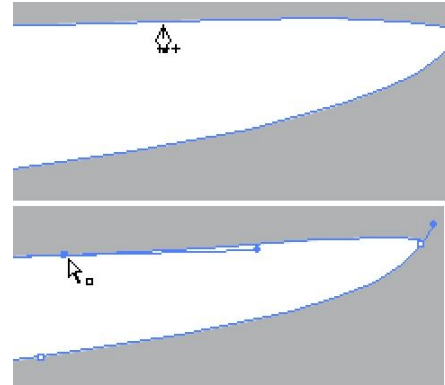


8. If a cutout is too thin, you've got three options:
  - a) **increase the design size** (see A3.1 Point 8)
  - b) **expand the size of the cutout.**  
Click on the Form Tool , and add an additional anchor point to the line selected by doubleclicking the mouse. Drag this point with the mouse until the cutout is thick enough.
  - c) **decrease the cutout**  
Draw a rectangle, place it over the cutout, so that it will be made smaller as you'd like. Select the design and the rectangle, weld them together.

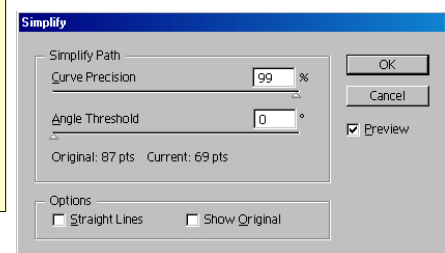


## Section 4.2: Adobe Illustrator CS

1. There's not much difference between the techniques we've just talked about for Corel and what works with Illustrator. So, we'll just go from the part of working with anchor points.
2. To add an anchor point, select the design, and click on the toolbar on Pencil Tool.  And add a point to where you'd like (you'll see a little plus sign once you're on the line).
3. To move the points, select the Direct Selection Tool  and click on the point that you want to move. Pay attention that just one point is selected (the point will turn blue), otherwise you'll be moving the whole design, not just the one point.

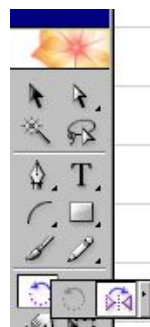
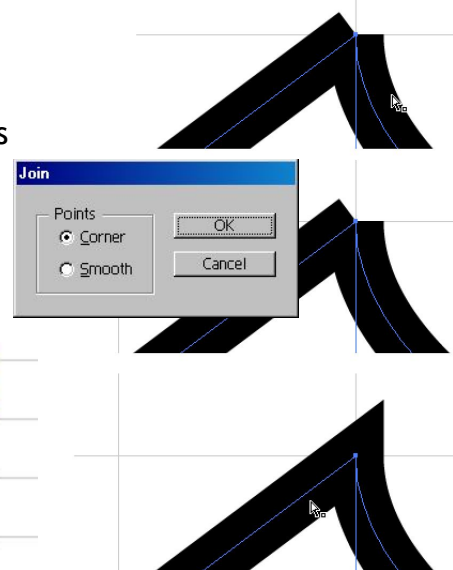
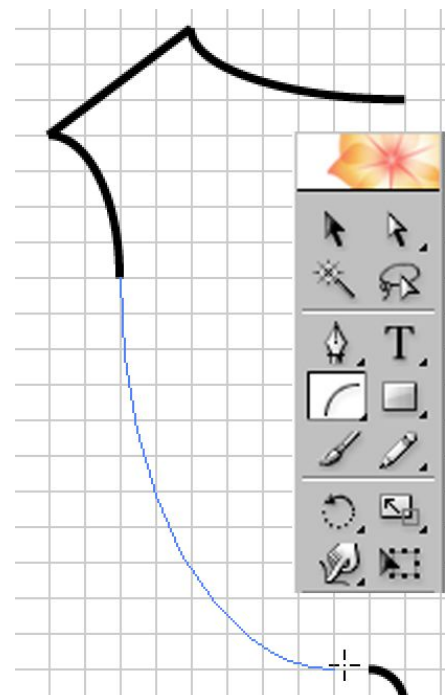
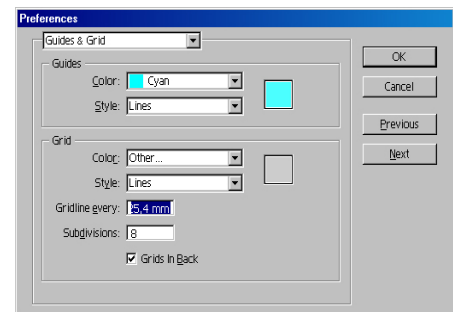


The whole design should not have over 1000 anchor points. Under 'Object' - 'Path' - 'Simplify', you can reduce these by 98/97%. In doing so, sharp corners are usually rounded off. Because of this, we don't recommend simplifying by 50% (the number of points will only be shown if the Preview is activated).



## Section 5: An Example in AI CS2

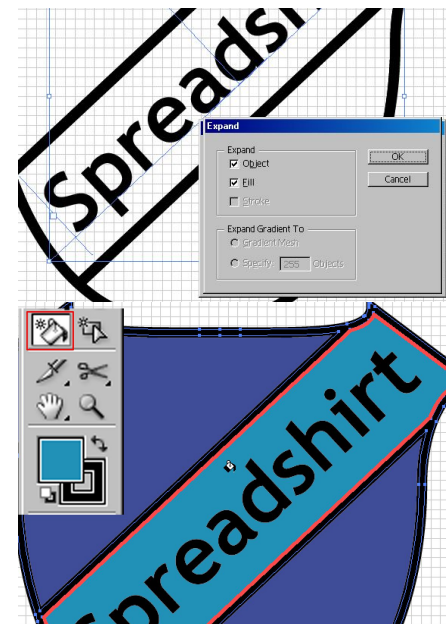
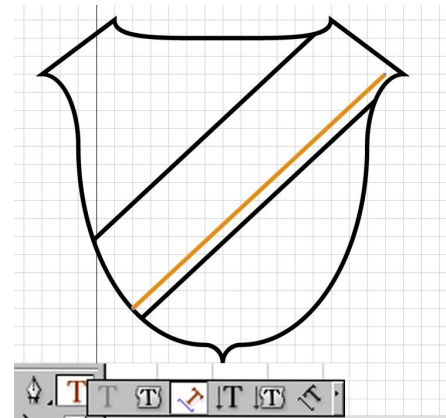
1. This example will show all the functions we've discussed up to now and apply them to create a finished logo.
2. The logo should be symmetrical and even to help us along, we can activate a grid (View- Show Grid). Under Edit - Preferences - Guides and Grid - you can set the spacing of the grid. With a 1.5 mm spacing, you'll be able to see the thickness of the line quite easily. Under View again, select Set on Grid. That way, lines created will be automatically oriented to the grid points.
3. Then create a Line Segment and Arc Tool to add more paths, that later will become an emblem.  
The Arc Tool is relatively easy: you set the start point and end point and the arc is automatically draw.  
If you want to change the direction of the arc, just switch the positions of the start and end points.
4. Individually created paths, or 'open' paths always have to be linked. There are two options: either two paths make a corner or a bridge. In both cases, first select both end points of the paths (Direct Selection Tool) and put them together via 'Object' - 'Path' - 'Join'. Then select whether this is a corner or a bridge. For a bridge, both paths will be automatically joined, so long as they aren't on top of each other. All corners and bridges have to be joined.
5. Once one side of a design has been finished, you can just copy, reflect (Reflect Tool), and Connect the end points.





6. The function 'Object' - 'Path' - 'Outline Stroke' converts all strokes into paths.
7. Now, to add a text that matches the logo. To do so, first draw a line that the text should be oriented on. Select the type on a Path Tool and click on the line you just made (this will disappear as soon as you start typing - so the colour/shape is irrelevant).
8. After you've set the position, font and size, you should convert the text into paths under 'Object' - 'Expand'.
9. In between - make sure to check with a circle or just with the grid, that all lines are thicker than 1.5mm. If not, you can expand the logo, or add another stroke where needed.
10. To fill the layers with colour, first select the design and then the Live Paintbucket Tool to fill in the area with the colour you want (a red outline will be shown). Then you should convert the design with Object - Expand...!

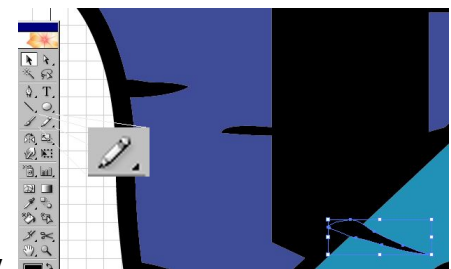
After you've ungrouped the entire design ('Object' - 'Ungroup'), you can bring the different layers to the front or to the back (right mouseclick on the object you want, and Arrange). This lets you add, for example, another text element behind the text, but in front of the emblem design.



11. After clicking Expand again and the using the function Merge in the Pathfinder ('Window' - 'Pathfinder'), the design looks quite good. Don't forget to always check the size (red circle = 1.5mm).



12. To add cutouts, you can use the Paintbrush Tool - use it to draw a few cuts with the mouse. Pay attention that the areas you draw are closed - you will automatically see this as soon as you cross over a start point. Now you can fill in the automatically made areas with the same colour as the background (in this case, black).



13. After the cuts are finished (make sure they follow the size rules), you can use that Merge Tool again (in Pathfinder). This will remove the cuts from the design (it's possible to use this function multiple times).



14. The final touch: the black emblem should have an outline that is evenly spaced from the emblem.
15. First, fill out the black background (that is - there shouldn't be any more holes or cutouts, otherwise the outline will go around them). Then copy the entire design and select under 'Edit' - 'Paste in Front'. Then colour everything black and click on Merge again.

Then add an outline (yellow) that's about 4 pts wide around this area (align=outside). And convert to paths ('Object' - 'Path' - 'Outline Stroke').

Then do the same once again - with a black contour. After you've clicked Merge again - just for the top layer, you can delete all layers, except for the external contour. Left over should be the finished design with an outline that has a set distance from the design.

